

Haorui Zhang

4/5/2019

HW10

1. Block 00: Miss, put into set 0. Set 0 currently: 00
Block 04: Miss, put into set0. Set 0 currently: 00,04
Block 02: Miss, put into set0. Set 0 currently: 00,04,02
Block 08: Miss, put into set0. Set 0 currently: 00, 04, 02, 08
Block 04: Hit, this is in set 0. Set 0 currently: 00, 04, 02, 08
Block 12: Miss. Put into set 0. Set 0 currently: 12, 04, 02, 08
Block 04: Hit, this is in set 0. Set 0 currently: 12, 04, 02, 08
Block 08: Hit, this is in set 0. Set0 currently: 12, 04, 02, 08
2.
 - a. Page fault: the memory address and the data that been accessed by page table is not in the physical memory, but in the hard drive. The virtual bit of that address with the page number is 0
 - b. Swap: Exchange a page from hard drive to the physical memory and vice versa.
3.
 - a. $4\text{ KB} = 2^{12}$. $1\text{ GB} = 2^{30}$, $4\text{ GB} = 2^{32}$
Entry number in page table = $4\text{ GB} / 4\text{ KB} = 2^{32} / 2^{12} = 2^{20}$
Entry number in physical mem = $1\text{ GB} / 4\text{ KB} = 2^{18}$
There is 19 bits in each entry of the page table.
The total bits in the page table is $2^{20} * 19 = 19,922,944$
 - b. The page table is stored in the virtual memory. The user provides the address with virtual page number and page table register stores it and uses it in page table for proper page.